**Before the**
**Federal Communications Commission**
**Washington, DC 20544**

**In the Matter of**

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| **Amendment of Part 101 of the Commission's Rules To Facilitate the Use of Microwave for Wireless Backhaul and Other Uses and to Provide Additional Flexibility to Broadcast Auxiliary Service and Operational Fixed Microwave Licensees** | ) | **WT Docket No. 10-153** |
| **Request for Interpretation of Section 101.141(a)(3) of the Commission's Rules Filed by Aleatel-Lucent, Inc. et al.** | ) | **WT Docket No. 09-106** |
| **Petition For Declaratory Ruling Filed by Wireless Strategies, Inc.** | ) | **WT Docket No. 07-121** |
| **Request For Temporary Waiver of Section 101.141(a)(3) of the Commission's Rules Filed By the Fixed Wireless Coalition** | ) | |

## Reply Comments of United States Cellular Corporation

United States Cellular Corporation ("USCC") hereby files its Reply Comments in the above-captioned proceeding. In our Comments, USCC supported expanded sharing of CARS and BAS spectrum in the 6875-7125 MHz and 12700-13200 MHz bands to allow increased microwave backhaul, coupled with allowing BAS licensees to use the shared frequencies for the "final links" in their transmission paths, as proposed in the Notice of Proposed Rulemaking in this proceeding.[1] USCC also endorsed the use of "adaptive modulation" for microwave systems in the 6 and 11 GHz bands. However, USCC continued to oppose the use of microwave "side lobes" to create "auxiliary" microwave paths, owing to the interference such facilities would cause to licensed point to point facilities in the relevant frequency bands.

[1] Notice of Proposed Rulemaking and Notice of Inquiry, WT Docket Nos. 10-153, 09-106, and 07-121, FCC 10-46, 25 FCC Rcd 11246 (Rel. August 5, 2010) ("NPRM-NOI").

With respect to the "NOI" portion of the NPRM-NOI, USCC, while supporting the promotion of microwave service in rural areas and the existing waiver process with respect to bandwidth capacity, opposed placing in the FCC's rules any automatic permission to reduce microwave efficiency in rural areas. However, USCC endorsed a review of microwave antenna size requirements, particularly as applied to the 6 GHz band in rural areas. The comments filed in this proceeding provide ample support for these positions, as well as also raising important questions about how best to increase backhaul capacity.

## I. Backhaul Capacity Must Be Expanded And Perhaps Additional Frequencies Should Also Be Considered For This Purpose.

It is undisputed that the market for wireless data is growing exponentially, and this growth has generated and will continue to generate a corresponding need for increased backhaul capacity, including wireless microwave facilities.[2] Accordingly, many commenters have joined USCC in supporting allowing "fixed service" ("FS") licensees to share additional BAS and CARS spectrum, particularly the 6875-7125 MHz and 12700-13200 MHz bands, owing to the suitability of those bands for backhaul uses.[3] However, it is also fair to note that other commenters have called attention to the serious frequency coordination challenges which will be created if those hands are opened to FS usages, particularly with respect to existing mobile broadcast auxiliary station and mobile satellite use of those frequencies.[4]

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[2] See e.g. Comments of T-Mobile, USA in Docket 10-153 et al. ("T-Mobile Comments"), pp. 1-2; Comments of Verizon and Verizon Wireless in WT Docket No. 10-153 et al ("Verizon Comments, pp. 2-3; Comments of AT&T, Inc. in Docket No. 10-153 et al ("AT&T Comments"), p. 3 ("Over just the last three years data traffic on AT&T's mobile network is up almost 5,000 percent - a compound annual growth rate of 268 percent").

[3] See, e.g. Comments of Ceragon Networks, Inc. in Docket No. 10-153 ("Ceragon Comments"), pp. 2-3; Comments of Clearwire, Inc. in Docket No. 10-153 et al. ("Clearwire Comments"), pp. 7-8; Verizon Comments, pp. 2-4; T-Mobile Comments, pp. 2-3.

[4] See, e.g., Comments of Society of Broadcast Engineers, Inc. in Docket No. 10-153 et al. ("Broadcast Engineers Comments") passim; Comments of The Association of Maximum Service television, Inc. and The National Association of Broadcasters in WT Docket No. 10-153 et al. ("MST/NAB Comments"), passim; Comments of Satellite Industry Association in WT Docket No. 10-153 et al. ("SIA Comments"), pp. 1-11.

In response, USCC would note that the FCC has, in past, often been able to solve difficult frequency coordination problems, including interservice issues, and may well be able to deal with the coordination issues in this context.[5] An additional possibility may be that the FCC could reserve different frequencies for the FS, FSS, CARS, and BAS services within the relevant frequency bands.[6] And the FCC may have eventually to make the judgment that providing the necessary bandwidth for wireless broadband, which is vital to the economic future of the United States, may have to take precedence over frequency allocations reflecting the spectrum priorities of a bygone age. However, the Commission must carefully review the interference concerns which have been raised. It will help no licensee in any service to be subject to interference from co-channel and adjacent channel licensees.

Another possibility identified by various commenters may be to look to different, less "crowded" spectrum than that which is identified in the NPRM/NOI, namely the 7125-8500 MHz band now used by government licensees . It may be possible, after adequate consultation with NTIA, to institute a "public/private sharing" of those frequencies, to be modeled "after the sharing framework used in the 23 GHz band by federal and non-federal users."[7] The comments cited below are persuasive that such sharing may be achievable and would certainly be desirable.

It appears, however, from the comments that expansion of the frequencies available for wireless backhaul may not happen quickly, given the issues which have been raised by licensees now occupying the proposed spectrum and the problems inherent in sharing government

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[5] T-Mobile Comments, p. 6, n. 14.
[6] Comments of The National Spectrum Management Association in WT Docket No. 10-153 et al ("NSMA Comments"), p. 5.
[7] AT&T Comments, pp. 7-8. See also Comments of The Telecommunications Industry Association in WT Docket No. 10-153 et al., ("TIA Comments"), pp. 5-6; Comments of Motorola, Inc. in WT Docket No. 10-153 ("Motorola Comments ), pp. 5-6.

spectrum. Thus, there is all the more reason for the FCC also to consider the practical proposals of PCIA to assist wireless antenna construction using presently authorized frequencies.[8]

PCIA proposes new FCC rules to accelerate deployment of wireless microwave facilities, ranging from allowing smaller antenna sizes in certain circumstances to pre-empting local bans on microwave and other wireless antennas by adopting rules similar to the FCC's Over-The-Air-Reception Device ("OTARD") rules, which pertain DTV receiving "dishes."[9] Those approaches certainly also should be considered, especially if new frequencies are not quickly allocated for wireless backhaul.

Lastly, USCC would note that its support for eliminating the "final link" rule now applicable to BAS licensees was contingent on wireless licensees being given access to frequencies now restricted to BAS and CARS licensees and on comparable technical requirements being imposed on all licensees using the same frequencies.[10] Failing that, the existing rules should be left as they are. The FCC certainly should not leave wireless backhaul worse off than at the beginning of this proceeding.

## II. There Is A Solid Consensus In Favor of The Adaptive Modulation Proposal.

In our Comments (pp. 4-6), USCC staunchly supported the "adaptive modulation" proposal of the Fixed Wireless Communications Coalition ("FWCC") as reformulated in the NPRM/NOI. Adaptive modulation allows FS "data rates" to drop below the minimum "payload capacity" for limited times, allowing FS licensees to maintain communications when adverse propagation characteristics would otherwise force transmissions to be terminated.

The comments reflect a solid consensus in support of the concept of adaptive modulation, coupled with a requirement to require licensees wishing to use this technique to so state in their

[8] Comments of PCIA-The Wireless Infrastructure Association in WT Docket No. 10-153 et al. ("PCIA Comments").
[9] Ibid.
[10] See, e.g. AT&T Comments, p. 9.

prior coordination notices.[11] USCC joins in that consensus and reiterates its support for adaptive modulation.

The comments however, also reflect a continuing dispute between those parties, such as FWCC, which support a flexible approach to adaptive modulation, relying on microwave licensees maintaining minimum spectrum capacity "on average,"[12] and those commenters, like Verizon, [13] which support a stricter approach to permissible drops in "payloads." USCC believes the FCC should examine this issue carefully, and try to arrive at a rule which balances the need for flexibility with the importance of protecting spectral efficiency and equipment quality.

## III. The Comments Reflect Overwhelmingly Strong Opposition to the "Auxiliary Station" Proposal.

In our Comments (pp. 6-7), USCC expressed our continuing opposition to the proposal that FS licenses be permitted to coordinate multiple "auxiliary" microwave links within microwave "side lobes" whose transmitter elements allegedly would collectively comply with the FCC's antenna standards and frequency coordination procedures. USCC argued that this proposal, even as modified by the FCC in the NPRM/NOI, would have the primary and undesirable effect of increasing interference to licensed facilities.

This position is virtually identical to that of the great majority of commenters in this proceeding, including the leading frequency coordination organization and wireless carriers of all types.[14] Read together, these comments make an irrefutable case that the proposal has the

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[11] See, e.g., T-Mobile Comments, pp. 8-10; Comments of Sprint Nextel Corporation in WT Docket No. 10-153 et al ("Sprint Comments"), p. 5; AT&T Comments pp. 10-14; Motorola Comments, pp. 6-8.

[12] See, Comments of Fixed Wireless Communications Coalition in WT Docket No. 10-153 et al, pp. 8-9.

[13] Verizon Comments, pp. 5-10.

[14] See, e.g. T-Mobile Comments, pp. 10-12; Comments of Rural Telecommunications Group in WT Docket No. 10-153 ("RTO Comments"); TIA Comments, pp. 8-10; Comments of Stratos Offshore Service Company, in WT Docket No. 10-153, et al. ("Stratos Comments"); Verizon Comments, pp. 13-20; Comments of Comsearch in WT Docket No. 10-153 et al. ("Comsearch Comments"), pp. 3-17); Comments of Blooston Law Licensee, in WT Docket No. 10-153 et al. ("Blooston Comments"); AT&T Comments, pp. 15-19; NSMA Comments, pp. 8-54; Supplemental

potential of causing interference to licensed facilities to a degree that overall service would be reduced rather than increased. It clearly should not be adopted, especially in a proceeding intended to increase backhaul capacity.

## IV. The FCC Should Explore the Possibility of Improving Service by Allowing Smaller Antennas and Perhaps Taking Other Steps.

Many commenters have joined USCC in endorsing FCC consideration of permitting smaller antennas and other equipment modifications in appropriate circumstances. Fibertower, for example, notes that smaller antennas:

> "provide many substantial benefits for fixed services licensees and consumers, including manufacturing, installation and maintenance cost advantages." [15]

Motorola also supports the use of smaller antennas and demonstrates their cost effectiveness and reliability in rural areas, where there are few licensees and thus where high gain antennas are less necessary than in more spectrally "dense" areas.[16]

But USCC is also mindful of the cautions raised by AT&T with respect to the use of smaller antennas, even in rural areas, and with respect to a lowering of microwave efficiency standards generally.[17] We do not disagree that these issues should be approached with caution. But, we do believe that the use of smaller antennas in rural areas may permit increased tower construction, as well as more antenna collocations and thus result in better frequency utilization. Accordingly we support the FCC's actively exploring this issue, perhaps through the issuance of a Notice of Proposed Rulemaking on the subject.

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Comments of the Fixed Wireless Communications Coalition in WT Docket No. 10-153 ("Supplemental FWCC Comments"), passim.

[15] Comments of Fibertower Corporation in WT Docket No. 10-153 ("Fibertower Comments"), p.13.

[16] Motorola Comments, pp. 10-11.

[17] AT&T Comments, pp.15-17.

## Conclusion

For the foregoing reasons, and those given previously, USCC supports amending the FCC's rules to permit expanded sharing of BAS and CARS spectrum for wireless backhaul purposes, and/or finding comparable new spectrum sufficient to permit the necessary expansion of wireless backhaul capacity. And USCC continues to support "adaptive modulation" of microwave signals and oppose the "auxiliary" use of microwave spectrum. USCC believes that the FCC should carefully explore amending its rules to permit smaller antennas in rural areas, while remaining cautious about diminishing the overall efficiency of wireless microwave facilities. The FCC's primary purpose in this proceeding, as in other related proceedings, should be to provide more spectrum to wireless carriers for backhaul and other purposes, to accommodate the crushing demand for broadband data services which such carriers will have to meet in the coming decades.

Respectfully submitted,

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